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JOURNAL OF ELECTRICITY

POWER AND GAS

Devoted to the Conversion, Transmission and Distribution of Energy

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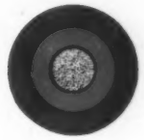

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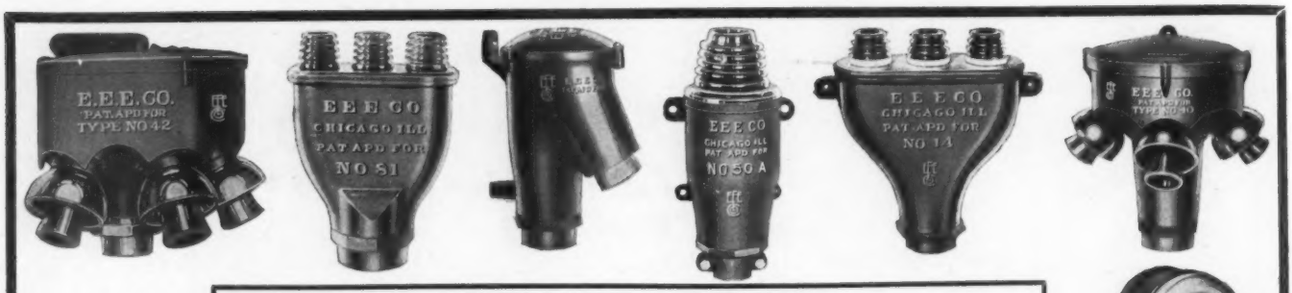

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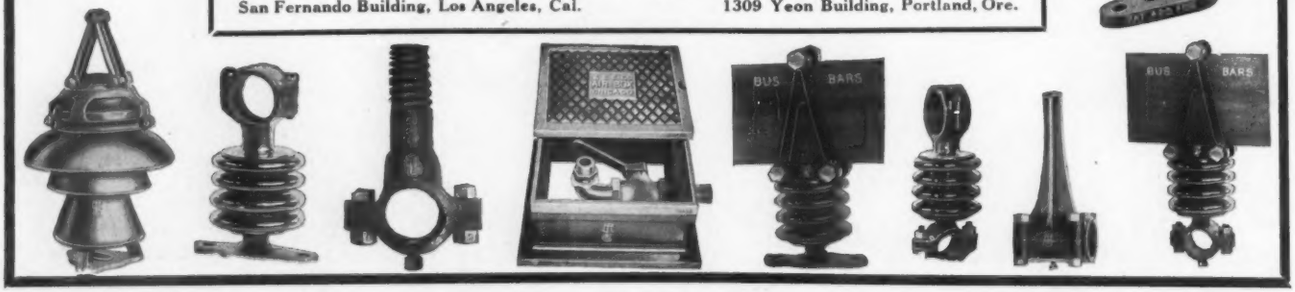

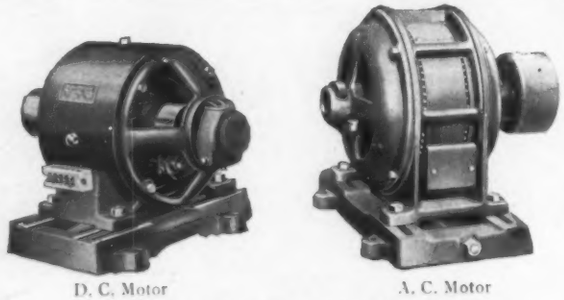

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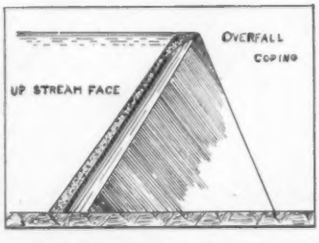

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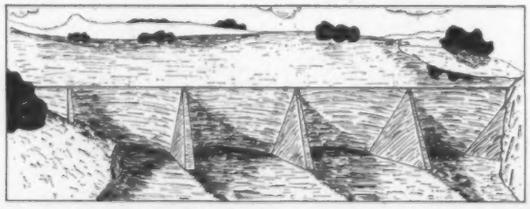

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POWER AND GAS
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VOLUME XXVII SAN FRANCISCO, DECEMBER 0, 1911 NUMBER 24

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THE OREGON POWER COMPANY

BY A. H. HALLORAN.

Oregon's most famous valley is that of the Willamette, whose thirty-mile width parallels the lofty crest of the Cascades for nearly one hundred and fifty miles to its junction with the mighty Columbia. At the head of this great valley, checkered with fields and orchards and flanked by mighty forests of fir, stands the thriving city of Eugene, and for fifty miles to the north the transmission lines of the Oregon Power Company distribute light and power to a busy and prosperous people.

Nature has endowed this country with fertile soil, a beneficent climate, abundant waterpower, great mineral wealth and tremendous timber resources. Man has created an environment of culture and refinement by the establishment of two State colleges, at Eugene and at Corvallis, which are attracting a most desirable class of homeseekers.

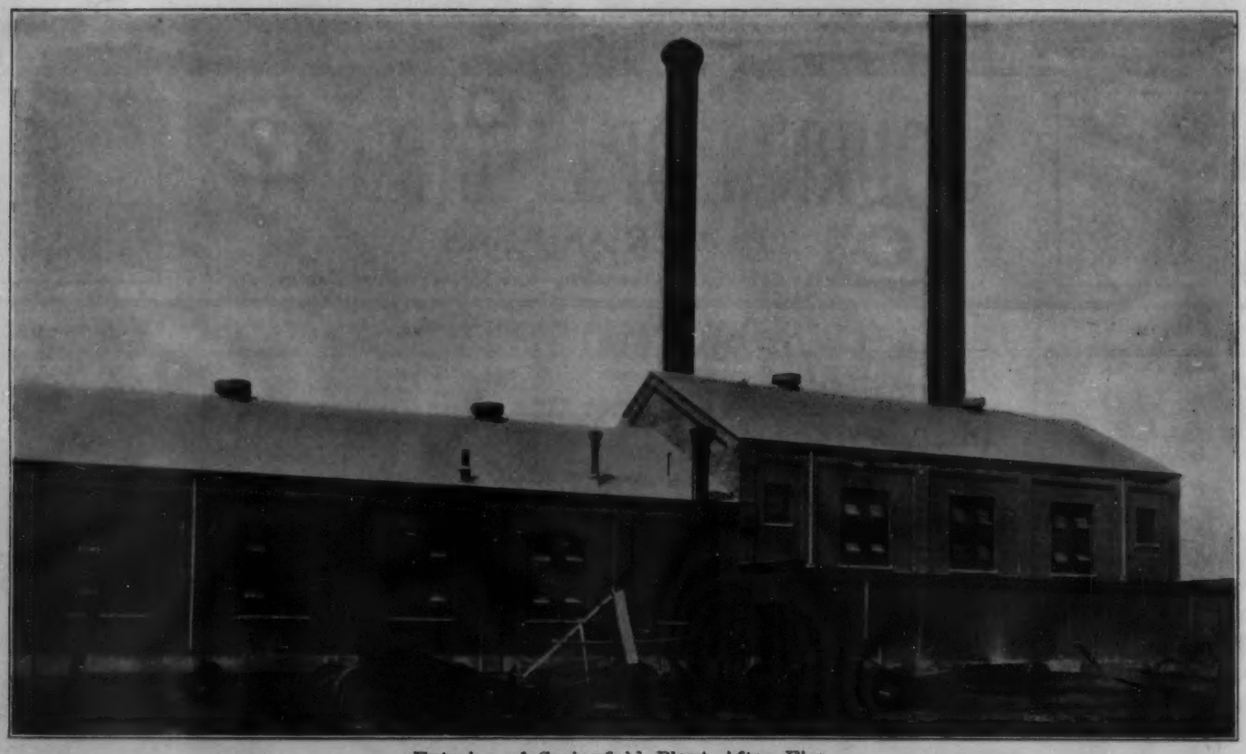
The several electric power, gas and water plants which supply the needs of this community were acquired by the Oregon Power Company, May 1, 1910, and the various improvements and extensions which have been completed since that time make their description a matter of present interest.

Interior of Oregon Power Company's Springfield Plant.

The company maintains its principal office at Eugene with generating plants at Springfield, Albany and Dallas. These and intermediate towns are tied together by an extensive network of high voltage transmission lines.

Springfield Steam Plant.

The company's largest plant is at Springfield, 3½ miles east of Eugene on the east bank of the Willamette, the two towns being connected by electric railway. This plant has a capacity of 3000 kw. in



Exterior of Springfield Plant After Fire.

three steam turbine units, generating three-phase power at 60 cycles, 2300 volts.

These units comprise a 2500 k.v.a. horizontal Curtis turbine generator, operated at 1800 r.p.m., and two 500 kw. horizontal Allis-Chalmers machines, operated at 3600 r.p.m. Excitation current is furnished by three 35 kw., 125 volt dynamos driven by horizontal Curtis turbines.

The control of this apparatus is exercised through a 13 panel switchboard on the main generator floor. These panels comprise four generator sections (one blank for future 2000 kw. unit) three exciter sections, one Tirrill regulator, four feeder panels and one small arc light panel for the street lights of Springfield. All the connections between the machines and the switchboard are made with asbestos covered cables run in tile ducts.

Steam is furnished at 150 to 160 lb. pressure by two 500 h.p. Stirling boilers and three Cahall water tube boilers, one of 400 and two of 300 h.p. The plant is of peculiar interest on account of the fact that sawdust is used as fuel, each boiler being equipped with Dutch ovens for this purpose. These ovens feed from above through a chain conveyor from the mill.

This plant was built within 100 ft. of the Booth-Kelly Lumber Company's mill which was burned to the ground in July of this year and which was the source of sawdust and slab wood for fuel. That the power plant was not burned confirms the wisdom of the company's engineers in advocating a fire-proof station in spite of its greater cost as compared with a wooden building and corrugated iron covering.

The building is a brick structure on concrete foundations with a concrete pit containing the auxiliary apparatus below the generator floor. The roof is a wooden truss covered with asbestos shingles and the windows are of wire glass. Although the heat from the fire was so intense on the mill side of the station that a man protected with wet sacks could stay there but a few seconds, the wire glass windows withstood the test. The glass was cracked in many places but did not fall out, which is the only reason that the station equipment was not damaged. If this fire had penetrated to the rear of the switchboards, which stand closely to the windows, it would probably have so badly short circuited the bus and feeders that the system would have been tied up for a much longer time.

The fuel bin, conveyor house and conveyor machinery was almost totally destroyed by this fire. These buildings were wooden structures and could not be saved when the water supply ran out, due to the destruction of the gate to the log pond. In addition to this about 1500 feet of poles and feeder circuits running from the power station toward the step-up substation some 2500 ft. distant were burned. The destruction of these lines interrupted service to the entire district, but due to the heroic efforts of the operating and construction forces they were temporarily rebuilt and service from the Springfield plant restored in less than twenty hours from the time of the interruption. In the meantime, a part of the Eugene load was carried by the Albany hydroelectric plant, some 45 miles away.

After the supply of refuse and hogged material from the Booth-Kelly mill was cut off, the company was compelled to burn slab wood shipped in from neighboring mills until a small fuel bin with a motor driven hog and chain conveyor could be completed. The slab wood is delivered from the cars to the hog, a cast iron drum containing a set of revolving knives which reduce it to very small chips. This is conveyed to the bins with one conveyor and from the bin to the Dutch ovens over the boilers in another. The

increase in evaporation from hogged slab wood over unhogged slab wood is about 15 per cent. This improvement in efficiency, as well as the saving in handling expense, fully warranted the investment in this equipment.

As an insurance against interruption of service due to the possible burning of the mills which are now furnishing slab wood to the power company, all the boilers are being equipped with an oil-burning system having an oil storage capacity of 50,000 gallons of fuel oil in two steel drums buried underground near the boiler room. This supply of oil will carry the present load for about two weeks. The oil-burning system will not only serve as a relay when the supply of slab wood is interrupted but will be used in conjunction with the hog-feed when sudden increases in load make unusual demands on the boilers that cannot be taken care of quickly enough with hog-feed. The burners are installed in the rear of the furnace, the flame being projected toward the front where the cone-shaped pile of hog-feed is burning.

Transmission.

Power is generated at 2300 volts at Springfield as well as the other power plants and is transmitted at 33,000 volts over the longer lines and at 11,500 over the shorter, being subsequently distributed at 2300 volts. No. 4 solid copper wire is used for the 33,000 volt lines which are designed for an ultimate voltage of 66,000. No. 2 bare wire is used for most of the 11,500 volt transmission, though there are 12 miles of No. 3 aluminum between Albany and Corvallis. Cedar poles and fir cross-arms are used throughout, the 33,000 volt line also carrying the 11,500 volt conductor beneath the high tension wires for most of its distance.

Power from the Springfield steam plant is taken at 2300 volts, 2500 ft. to the Springfield substation through two sets of 300,000 circular mil copper conductors, another feeder being used for local distribution. This station has two banks of three 500 kw. General Electric water cooled transformers, one bank raising to 11,500 volts for transmission 3½ miles to Eugene and 15 miles to Harrisburg, and the other bank to 33,000 volts for transmission 45 miles to the Albany substation. The same pole line carries the 33,000 and 11,500 volt conductors to Harrisburg where the latter terminate. From Harrisburg a 2300 volt line runs to Junction City, four miles distant.

At Eugene a small brick substation has been constructed in which are installed three 500 kw.-11500-2300 volt step-down transformers, one 300 kw. synchronous motor generator set furnishing 500 volts direct current to the street railway system (independent) in Eugene, and one 100 light tub transformer with all necessary feeder panels and arresters.

The Albany substation is similar in design to that at Springfield and steps down from 33,000 to 2300 volts for local distribution and to 11,500 volts for transmission back over the same pole line to the towns of Tangent, Shedds, Halsey and Brownsville. Another 11,500 volt line runs 12 miles from Albany to Corvallis whence it extends seven miles to Philomath.

With the exception of the main substations at Springfield, Eugene, Albany and Corvallis, all voltage transformations are made at open air pole-type transformer stations, voltage being reduced from 11,500 to 2300. The lighting circuits are 110-220 volt three-wire in congested districts and two wire in the outlying territory.

Automatic oil switches with inverse time limit relays are connected on both the low and high tension sides of the transformers in the main substations which are also equipped with aluminum cell lightning arresters mounted on the upper floor with the high tension switches. The incoming and outgoing high tension lines enter through roof insulators attached to conical concrete supports of local design.

Springfield Substation.

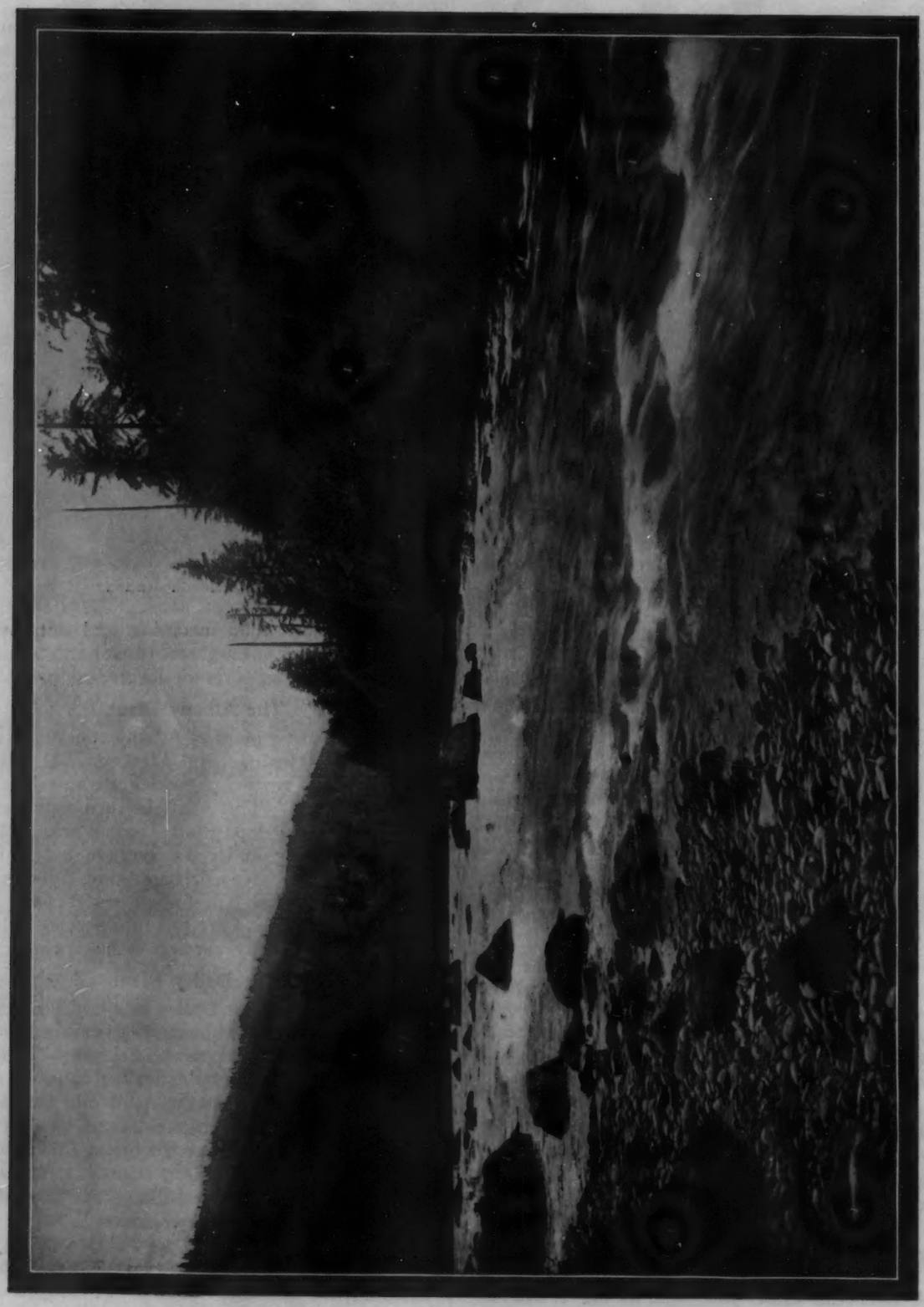
The Albany Plant.

The generating plant at Albany consists of one 200 kw. and one 300 kw. General Electric, 2300 volt, three-phase, 60 cycle, revolving field generator belt driven from a line shaft. This shaft in turn may be driven either by two 350 h.p. Platt Iron Works horizontal turbines operating under an average head of 25 ft. or by a 400 h.p. Bates-Corliss engine. Steam is furnished by three 150 h.p. Cahall water tube boilers. The engine and boilers are put into service only when the Springfield-Albany service is interrupted.

The Dallas Plant.

The steam plant at Dallas is not yet tied in with the main transmission line and serves the towns of Dallas, Monmouth and Independence. The power plant adjoins the mill of the Dallas Lumber & Logging Company, where sawdust and mill refuse is obtained for fuel. The equipment consists of two 200 kw., 2300 volt, three-phase revolving field General Electric alternators belted to Corliss engines, one being an 18x48 Hoffman & Billings and the other 18x42 Lane & Bodley. A 5½ kw. exciter is belted to each of the generator shafts.

The steam is supplied by two 312 h.p. Babcock & Wilcox boilers and one 400 h.p. Stirling boiler, all equipped with Dutch ovens for burning sawdust. Fuel economy being no great object and condensing water being expensive, this plant is run non-condensing. Mill refuse is used only when there is not enough sawdust.



Oregon Power Company's Power Site on the MacKenzie River.

The Dallas plant will eventually be tied in with the rest of the system, thus giving 82 miles of transmission lines. The company owns a waterpower site in the McKenzie River which will be valuable whenever the power demands of the district warrant its development.

Aside from the lighting load, the company's chief consumers are the electric railways at Albany and Eugene, the various planing mills of the vicinity and an increasing number of irrigation pumping plants. Electric power is also used for pumping the water supply of Albany and Independence, these plants being owned and operated by the Oregon Power Company.

Eugene Gas Plant.

The company owns and operates the gas works in Eugene which supplies gas through a low pressure system (3 in.) to Eugene and a high pressure system of 5 lb. to Springfield. The Springfield gas is transmitted 3½ miles through a 4 in. line at 20 lb. pressure and then reduced to a distributing pressure of 5 lb. The new water gas plant, which has just been completed, has a daily capacity of 500,000 cu. ft. as against a daily capacity of 60,000 cu. ft. of the old gas plant, which it displaced. The new holder has a capacity of 150,000 cu. ft. which will supply the present needs of the two towns for over 48 hours. This large holder is supplemented with a small auxiliary holder of 20,000 cu. ft. capacity. Crude oil is used under the boilers for generating steam used in gas making and distillate is used in combination with the steam in the manufacturing process.

When this plant was taken over there were but 11¼ miles of mains which have now been replaced by 33 miles of large size, ample mains. A most aggressive campaign has been conducted to increase the number of consumers and the volume of gas required and a general reduction in rates has been effected.

The Oregon Power Company is under the control and management of H. M. Byllesby & Company of Chicago, M. D. Spencer being district manager at Eugene at the time this article was written. Subsequently Mr. Spencer took charge of the company's interests in northern Washington and has been succeeded by R. M. Jennings.

N. E. L. A. CONVENTION AT SEATTLE.

The annual convention of the National Electric Light Association will be held in the state armory at Seattle June 9 to 15, 1912. This building has a convention hall with a floor area of 6000 sq. ft. in addition to a gallery and two smaller meeting rooms. It also has an area of 8000 sq. ft. for exhibition purposes.

In addition to the technical and commercial sessions, the various manufacturers will present an extensive exhibit of electrical apparatus.

The railroads will give special round-trip rates from Eastern points with full choice of routing. W. J. Grambs of Seattle has charge of these arrangements locally.

As the association already has nearly ten thousand members a large attendance is anticipated at this first Western convention. The Pacific Coast members plan to make this the most notable meeting in the history of the organization.

PLANT VALUATIONS.[1]

BY W. D. SCOTT.

In the days of small industries, when it became necessary to take account of stock for the purpose of finding the standing of an enterprise, or in the event of a contemplated sale, the task was not one of great magnitude as compared with that of placing a value upon the property of any of the larger enterprises of the present time. Take for example, an inventory of a general merchandise business. An actual count and appraisement of the tangible property was limited to one, or at the most, a few buildings and their contents. There remained but the accounts receivable and accounts payable to complete the tangible property. There was but one intangible asset—"the good will" that something, the personnel of the business organization which had built up the standing of the business in the community which it served and which in turn, contributed to its existence.

Today we have a newer and larger term in more or less common use, to an extent synonymous with good will, "going value." This term means not only the feeling of the community toward any particular enterprise, but further represents the organization effort, the time, money and men spent in bringing from nothing a properly co-ordinated whole, which will perform the functions of any particular enterprise with maximum efficiency.

Take a large enterprise which has been established for any considerable period. Consider its tangible property and the number of points of valuation to be determined. We have book value, first cost in service, reproduction cost, and present value for property, which may be scattered over an area of thousands of square miles.

Let us first consider book value. It might at first sight appear as though the physical appraisement of a property should not consider this item, but there are two radically opposed systems of accounting which will influence any comparative figures.

There is the theory of accounting which has as a basis that plant, like matter, is indestructible; that a capital expenditure, once made, is permanent; and that even though the plant itself may have been replaced by new construction, the enterprise is entitled to charge such rates for its service as will enable it to pay a reasonable return upon its entire investment.

For instance, take as an example a railroad which had, in the early days of its development, built into a comparatively unsettled community. The roadbed was of necessity lightly constructed, the grades were heavy, the bridges were light. Had this sort of construction not been placed, the enterprise would not have been able to sell its transportation at a figure which would attract the maximum traffic and pay a reasonable return upon the investment.

The community grows, and to provide adequate facilities for the increased traffic, it becomes necessary to replace the light bridges, reduce the grades and perhaps change entire stretches of the right-of-way. Now it is argued that without the first track, those light bridges and the heavy grades, this second and improved construction could not have existed. Hence,

[1]Paper presented before Portland Section, A. I. E. E., October 17, 1911.

a rate should be charged for the present service rendered, which will not only pay on the existing investment, but the present rate for service should include an earning on the capital investment made on the original plant, although the original plant may have disappeared.

In counter distinction to the foregoing is a system of accounting which considers providing a fund to be laid aside out of earnings, that will provide for new plant, when existing plant has to be replaced because of inadequacy, obsolescence and decay or deterioration from natural and usual causes. In theory with this system of accounting, the plant is always maintained at a point near its cost in service value, through maintenance.

It has been held that the item of depreciation should be applied to keeping a property up to its in service value, but some of the larger corporations have considered that the term depreciation covers only such expenditures as are to be made to cover expected replacements necessary, through inadequacy, obsolescence and decay or deterioration; as previously mentioned. Repairs cover such expense as is necessary to replace short lived parts, or to otherwise keep the property in a state of proper operating efficiency. Repairs to be taken care of from current earnings and to be considered as a direct operating expense—while depreciation is taken care of from a fund set aside out of the earnings and gradually allowed to accumulate during the useful life of property.

An instance is called to mind concerning a municipal investigation covering rates of a public service corporation, in which the statements of its experts in the rate making regulation were contrasted with the statements of the same experts at a previous inquiry regarding taxes. It was a hard matter to make clear to the investigating body why a property might justly have one value for rate adjustment and another quite lower value for the purposes of taxation.

First cost in service valuations will apply more generally to the affairs of the company itself, and serve as a check upon the actual construction of the plant. Their greatest value aside from their use in preparation of cost studies for additions is that of placing an original value upon plant displaced through new construction. In order that the book value of any property may be in strict accordance with the actual plant, it is necessary to credit the construction account with such removals as may be made from time to time. This credit should represent in value what such plant cost originally and it should include all charges both direct and indirect, which have entered into the cost of the work. It is not sufficient to credit the construction account with the bare cost of labor and material, but other expense such as general office, supervision, engineering and interest on the sum invested during the construction in process period, should be added to the bare expense of actually performing the work.

Reproduction cost, or as it is sometimes defined, the cost to reproduce new, is the value more generally made use of in preparing figures for a physical valuation of a property. In order to arrive at such reproduction cost figures, a detailed summary of all units comprising the physical plant, such as material (supplies on hand), equipment, buildings, property and rights of way, together with their respective costs taken as of a certain date, are summarized to accord with the plant and property as it exists at that date. Such a compilation of data might be called an inventory, and falls logically into four distinct parts: the collection of field data, the making of summaries, the appraisement, and the determination of the amount of construction in process.

In making the appraisement, if figures representing the unit cost prevalent at the time the valuation is prepared, are used, some items will be found which cost more to construct at the time of their placing in service, than they would at the time of taking the inventory, due to advancement in the art or improved organization methods. As a balance against this there will be other items which undoubtedly are worth more in the present instance than they were at the time the construction was placed. For instance, it might be cited that should, through municipal legislation or far sightedness, a public service corporation place underground construction on unpaved streets, which, after the laying of this construction, were paved, it would be only right and just that the corporation in question should have the right to consider the underground construction so laid, as to have appreciated in value by the additional cost which would be entailed should it be necessary for them to place this construction in pavement rather than in the unpaved streets as was originally done.

It is thought that lack of consideration of this just appreciation has existed in various rate inquiries and that in one or two instances the investigating bodies have not allowed for this appreciation, but when it is considered that in the taxation of any property, its accrued value, due to the growth of the community is used as a basis of assessment, it would appear no more than just to allow for appreciation of properties in the taking of inventories on physical equipment.

After having obtained the necessary data and placed upon it a value, the serious question of depreciation must next be determined. Considerable misunderstanding has existed with regard to the term depreciation and the term is used in more or less contradictory language even in court decisions. Webster defines depreciation as "the act or state of lessening the worth of," and the depreciation of a property should not be confused with the method of laying aside funds for its ultimate replacement. While the fund may be called depreciation reserve, or it may be called replacement reserve, this fund itself should not be confused with the actual lessening in worth of the property.

Some of the larger corporations have carefully estimated how long the various units which go toward making up their entire plant will remain in service —not alone wearing value, but also considering the time at which the particular part of the plant under consideration, will of necessity have to be replaced, through inadequacy, or improvements in the art. It is often, in larger projects, impossible to estimate on an original investment beyond a given period, because if this is done, too large a capital expenditure would be necessitated in the first place, and it becomes preferable to take a basis of 15, 20 or 25 years as the replacement period for some of the particular portions of the plant; not because these particular items have

become defective through use, but because they would have become inadequate through growth of the community, or obsolescent through improvement.

It has been suggested by some that in a large corporation it is unnecessary to set aside a depreciation fund—that the plant as a whole would be so large and contain so many different parts which are being replaced from time to time that the depreciation fund becomes unnecessary, and that repairs made out of the current earnings will take entire care of the lessening in worth of the property. With any large plant at the present time, particularly those of the electrical industry, the development of the art has not reached such stability as will permit of any such gradual renewals. In fact, it might be generally assumed that there are cycles of replacement periods, and that should no fund have been provided as a reserve for replacements, for two or three years during these extensive replacement periods, the dividend and earning power would be greatly impaired.

It is thought, in connection with a plant valuation, the figures of which are to be used in connection with the matter of establishing rates, that no depreciation should be allowed below an in-service value—that is, to maintain an efficient operating organization, and to give satisfactory service, the plant would not be allowed to depreciate, as a whole, much below its reproduction cost. Should however, the figures prepared be used as a basis for taxation, the property should be allowed to appreciate to a point near its resale value. In other words, its actual present worth should be taken as a basis for taxation.

The Ford Franchise Tax Commission of the State of New York has taken this into account, and has allowed, in the fixing of taxes, corporations to reduce their underground conduit construction to a zero value, on an annual depreciation basis of 3 per cent. Other portions of the plant they have permitted reducing to a 10 per cent value. On other portions they require that a 75 per cent value should be maintained, claiming that on account of the intricate and delicate parts of the mechanism, that should the property depreciate beyond 75 per cent of its value, it would be impossible to render efficient service and retain this part of the equipment in use. The value of the physical properties, it must of course be recognized, has no relation whatever to the amount of money the corporation may have to its credit in the bank; nor have rates for service, so far as we have ever heard, been based on the amount of the company's surplus or reserve funds.

In conclusion one should remember that while the engineer must recognize the loss of value where it actually is, and make deductions for properties that have been worn out or superseded, he should not be misled into including hypothetical or academic values. In order to make the present value figures for any inventory or actual worth, it is necessary that the plant as a whole be carefully investigated and that particular attention be paid to the matter of present value. This can only be arrived at by an actual examination of the property in question by persons thoroughly familiar with all of the features of the particular enterprise under consideration.

UNITED STATES OIL INVESTIGATION.

The United States Bureau of Mines, in following out its investigations into petroleum, has just issued Bulletin No. 19, on the Physical and Chemical Properties of the Petroleum of the San Joaquin Valley, California, by Irving C. Allen and W. A. Jacobs. In detailing the investigations which are to be conducted by the Bureau of Mines, the authors say in their introduction:

"Realizing the great importance and wide application of petroleum and its products for fuel, lighting and lubrication, and the absence of authentic and comprehensive information in the literature on the commercial value of American petroleums, the United States Geological Survey has for a number of years been making analyses and other examinations of these oils and their products. In 1907 the technologic branch of the Survey began a study of certain economic problems having to do with the natural mineral oils. The prime object of the investigations was to determine the economic value of the petroleums and natural gases in the United States with special reference to the supplies in the public lands, and to ascertain how these resources could be utilized in the industries wtih the least waste and greatest efficiency.

"This work, which is now being conducted by the petroleum section of the Bureau of Mines under authority of the act of May 16, 1910, will include the collection at the wells and refineries of information as to the following details:

"Facilities for handling and storage at the wells. Facilities for transportation, whether by pipe line, rail, or water.

"Distance to the nearest port or center of industry and time necessary for delivery. Facilities for storage at such point of delivery. Suitability of the crude oil for fuel, or the treatment necessary to convert it most economically into the best fuel; best processes of refining or of converting the crude oil into its many products; the examination of these products; the utilization of the by-products and residues of the refineries; the collection of adequate and reliable samples, and the complete chemical and physical examination of these samples in the laboratory.

"It is hoped that the information thus obtained will render possible the establishing of suitable specifications for gasolines, kerosenes, certain lubricants, and fuel oils. In the near future a study will also be made of the problems involved in the most economical utilization of the heavy crude oils in the various types of internal-combustion engines.

"The gas-producer problem, because of its importance, will also be investigated, as a producer capable of converting the heavy oil residues directly and completely into a combustible gas would be of paramount value to the oil industry.

"The art of burning heavy oils under boilers for steam raising has not been developed to its highest efficiency and a thorough study of this problem also is to be undertaken.

TEST OF WESTERN CEDAR POLES.

The results of an exhaustive series of tests on the strength of round cedar poles are so contrary to the general notion as to make a brief summary of interest to all pole users. The tests were performed under the supervision of A. H. Griswold, plant engineer of the Pacific Telephone and Telegraph Company, R. T. Joslin being the inspecting engineer in charge.

Heretofore, poles for use in the Western States have been purchased upon the basis of Eastern specifications and it has long been suspected that the pole strength exceeded service requirements. These suspicions were more than confirmed by the tests and as a consequence the company has issued a new set of specifications which will bring about a great saving in the cost of poles purchased.

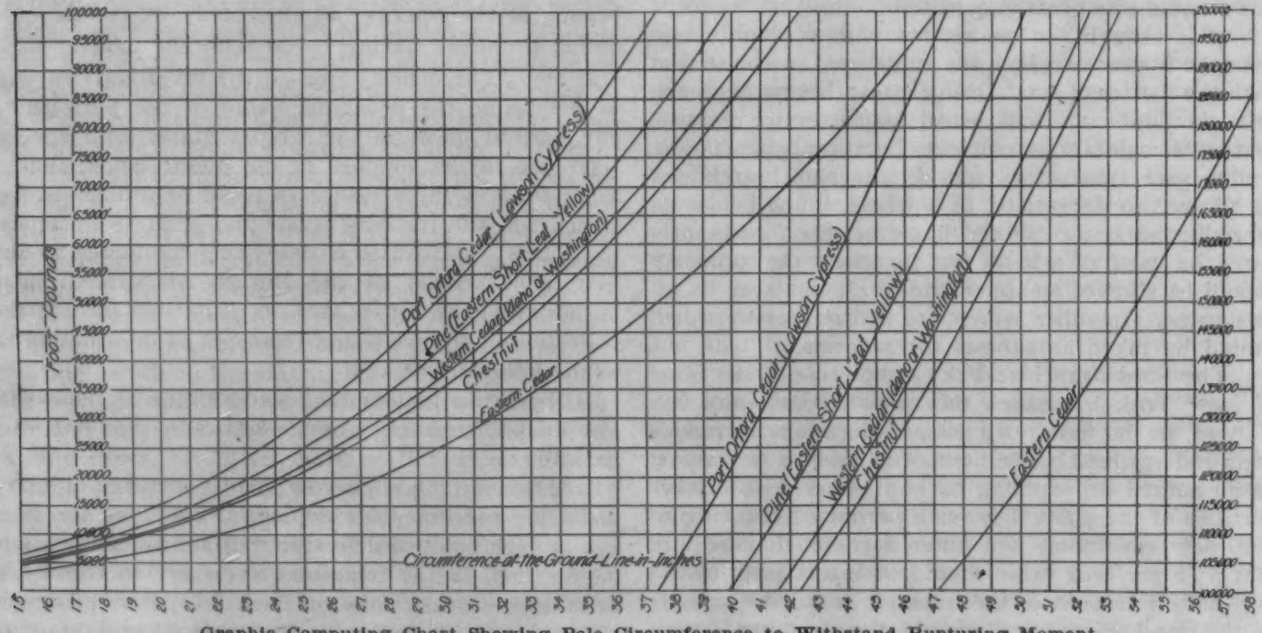
During the test every endeavor was made to duplicate actual field conditions. The poles were of round cedar, with sapwood, stripped of bark. Six feet of the pole was rigidly held so as to act as a beam solidly encased at the ground line. The pull, as horizontally applied near the top of the pole, was measured by a direct reading dynamometer, carefully calibrated.

The observed data included a measurement of the top deflection, the moisture content at the point of failure, the pole dimensions and weight, and the dynamometer reading at the time of fracture of both sapwood and heart. Photographs were taken in each case to show the character of the fracture and the modulus of rupture was calculated from the observed data.

In all, 81 poles were tested, there being an equal number of Western cedar from Idaho, Port Orford cedar from Oregon, and Western cedar from Oregon and Washington. These were segregated into 25, 30 and 35 ft. lengths of 6, 7, 8 and 9 in. top, were summer cut and well seasoned. In each case the data were carefully tabulated and individual curves were drawn to show the deflection at the various loads. The average results in each case were as follows:

Kind of Pole.	Modulus of Rupture.	Moisture Content.	Per cent of Sapwood Area.	Rings per Inch.	Weight per cu. ft. in lb.	Load at Failure
Western cedar from Idaho..	5268.53	10.1	26.254	20.324	22.741	2214.31
Port Orford cedar from Oregon	7218.38	12.061		15.99	26.654	3039.43
Western cedar from Oregon and Washington	5353.185	15.152	33.99	11.933	21.947	1928.666

The principal sources of weakness in Western cedar in order of their importance seemed to be (1) Injury to sapwood due to teredo pitting, bark trimmer's ax cuts or bruising; (2) rapid growth; (3) excessive sapwood; (4) weather checks; (5) knots; no center rot was encountered.


Port Orford Cedar (Lawson Cypress)
Pine (Eastern Short Leaf Yellow)
Western Cedar (Idaho or Washington)
Chestnut
Eastern Cedar
Circumference at the Ground Line in Inches

Graphic Computing Chart Showing Pole Circumference to Withstand Rupturing Moment.

The results show that Port Orford cedar is superior to Western cedar and also that it gives a more consistent performance, due probably to its uniformity in age and quality. Weather checks are an important factor in the weakening of Port Orford cedar and rapid growth makes a weak pole. The average of all these results have been summarized and combined with similar observations by the American Telephone and Telegraph Company on the accompanying chart, whose curves show the moments required for rupture of the various classes of round wooden poles.

From this chart it is possible to directly read the size of pole necessary to withstand a given pull. For instance, a 30 ft. pole subjected to 2000 lb. pull will have a moment of 60,000 ft. lbs. Following the 60,000 line to its intersection with the Port Orford cedar curve, we find that a pole having a circumference of 31.7 in. at the ground line will suffice, while Eastern short-leaf yellow pine requires 33.6 in., Western cedar from Idaho or Washington 35 in., chestnut, 35.7 in., and Eastern cedar 40.8 in.

"NEW BUSINESS" METHODS FOR THE SMALL CENTRAL STATION[1].

BY ARTHUR GUNN.

"New Business" methods, as its name implies, is the process of securing new business, and thereby increasing the revenue and usefulness of the central station. In every company, the "New Business" getting is so closely connected with other departments of the business, and particularly so in the small station where the entire management devolves on one man, that it is impossible to discuss the methods in this department, without incidentally, at least, touching on some features which might technically be considered to lie outside of the subject.

By a "small" central station we may consider as defined the company which is too small to have an executive staff, and where the responsibilities of all departments rest upon one man as manager. One adadvantage at least can be said to pertain to this arrangement—all departments are in close relation and harmony with each other. Such a manager does not have to contend with departmental indifference and jealousy which is often a serious factor of trouble in larger companies.

"The man behind the gun" is an essential element in this, as every human problem. Let us first take stock of our manager. He must be a man of excellence in many characteristics, for to succeed he must show ability in many directions. The man who has the essential characteristics to make a really successful manager for a small central station is the best possible timber for manager of a large one—and to that position he may well aspire to attain, either through the development of his small company into a large one, or from opportunities rising from the notable character of his work. Successful managers of small plants are not so numerous as to be individually inconspicuous from their number.

I would name as the essential characteristics of such a man

Dissatisfaction,
Ambition,
Intelligence,
Information,
Industry,
Tact,
Perseverance,
Courage,
Commonsense.

Rather a formidable list is it not? And yet the absence of any of these is a serious handicap. He must be perpetually dissatisfied with what he is and what he has accomplished—he must not "get stuck on himself." He must have ambition for greater and better things. He must have intelligence, and must have, or obtain, information. It seems almost a jest to say that the man with so many things to do should be industrious, but in this connection we are reminded of the witty preacher's definition of a lazy man as "The fellow who spends so much time doing what he wants, that he has no time for doing what he ought." And finally in dealing with his consumers, actual and prospective, he certainly will need tact, perseverance, courage and common sense.

[1]Paper presented at Spokane meeting Northwest Electric Light and Power Association.

Now let us take the case of the average small central station, in which one man is manager, superintendent, sales agent, and perhaps lineman and station operator. We will assume that this man is fairly qualified for his position, that is, that he has a fair working knowledge of the business. How can he best increase the business of the company?

First: He must bend his energies to giving satisfactory service.

The customer of an electric light and power plant is paying his money in the expectation of receiving a certain definite commodity. That commodity is electric energy to be delivered continuously for certain hours during each twenty-four, at an agreed voltage, and within agreed limits as to quantity. Uninterrupted service, and regular voltage are essential. While opration does not properly come under the head of "New Business," "New Business" succees is so dependent upon it, that we are justified in mentioning it. Our manager of the small plant will keep his lines and generating station in the best operating condition and efficiency of operation that faithful effort and the means at his command will allow. He will take care of all trouble as promptly as possible. A consumer left in the dark for a single night through the fault or negligence of the company never feels that any credit is due the company for the service furnished for the rest of the year. Meter reading and testing have an important bearing on the relations between the company and the consumer. A discourteous meter reader can make more trouble for the company in one month than an accommodating manager can straighten out in six. Too much care cannot be taken in handling complaints. A complaint properly handled to the satisfaction of the consumer will do as much toward getting new business for the company as any other method which the company may employ.

Our manager must have tact and courtesy.

Too many managers of plants big and little appear to assume that in furnishing service to their customers they are conferring a favor, and are dictatorial and even rude in their treatment of them. The true statement is that he is giving value for value received, and his motto should be "Charge what the service is worth, and deliver all that the customer pays for." If he is convinced that his rates are fair, and proportioned to the cost of service, he has nothing to apologize for and should never allow himself to be put upon the defensive or in an apologetic attitude. But he should remember that the difference between a large consumer and a small one is a difference in quantity and not in quality, and that his duty to each is equally great. Every customer is entitled to be treated as courteously as though he were the most important patron which the company had, and that it was absolutely necessary that the company should have his business.

The successful "New Business" man will constantly live in the atmosphere of his work. He will rise with it, stay with it, go to bed with it and sleep with it. To illustrate: The manager in a town of a thousand people, near here, who has been very successful, writes: "I know of no special methods of getting business in a small town only to put in every

minute working. On my way to and from work I call on prospectives. I also do soliciting right along with my wiring work. Sometimes I take men and tools and materials right up to a house; estimate and wire it. I have gotten the very hardest ones to come through by this method, as there seems to be a sensitiveness about being passed up for the next neighbor." This man certainly lives in the atmosphere of his business, and exhibits well directed energy and a keen judgment of human nature as well.

Of the uses of electric energy there are no end, and in this paper we deal with general principles rather than with details of specific apparatus. The electric iron has become almost universal—electric cooking devices are plentiful. Power applications are limited only by the ingenuity of the "new business" man and the size of the field. Electric soldering irons, glue melting pots, vulcanizers, heating pads, milk warmers, fans, and other apparatus can be put out in even the smallest communities. We give a few points which have been furnished us by various managers.

One writes: "Upon fitting out a house and turning on the lights, I call in the neighbors to inspect it. The people whom I have just lighted are more enthusiastic at this time than any other and will do more to help me to secure business than at any other time. Unless I sell an iron and a toaster outright I place them on trial for thirty days. I advertise the cost per hour to operate the different appliances so there can be no misunderstanding. I try to keep everybody satisfied, because in a small town a good knocker can go the rounds in a very short time."

Another furnishes a good "don't" hint. "I never place an electric device which is an excessive current eater in the hands of a customer who is liable to fail to understand in advance the apparently excessive bills which will naturally follow such an installation."

Efficiency should be the motto of every installation. Seek to give the customer that from which he will get the largest possible return for his money. Never be tempted to load a customer up with an excessive power or lighting installation.

Seek to build up your business upon lines already constructed, rather than to spread out too fast in new construction. Work to the end of having every house and building reached by your lines connected, and the maximum economical use of electric energy at each location, rather than a widespread system with sparse connections.

For the rural town, investigate the possibility of the country line. The farmer's telephone lines have covered the country, and the farmer's electric lines should follow them. Many farmers will advance the cost of construction, part or all of which may be returned to them by applying it upon their bills. Farmers are liberal power users when convinced of its practicability and economy.

In working up business in a new locality or extension, avoid holding public meetings—work man to man. However enthusiastic a meeting may appear to be, it is usually, consciously or unconsciously, hostile to the man who has a scheme to present. The average American loves to make a speech, whether he has knowledge of the subject or not. In such a meeting, the ill considered remarks of your friends may do damage, and criticism and opposition are liable to spread like wild fire. No opportunity is given at the ordinary public meeting to "close up," and business not covered by a signed contract is not yet secured.

Last of all, never forget that "New Business" getting is for the purpose of making money for your company, and never be tempted to take on business at unprofitable rates, or of an unsubstantial nature where the construction expense may be a dead loss to your company if the consumer fails.

It is important that the manager who wishes to develop the use of electric energy should keep himself as fully informed as possible regarding the manifold applications of this agency, in the forms of power, light and heat. In his comparative isolation, the first and most natural source of information is the printed page. Every station manager should take and read not one, but several electrical publications --advertisements and all. Indeed from the "New Business" standpoint, if he had to make a choice, we should recommend that he read the advertisements rather than the text. The flood of circulars and price lists which he naturally receives or which can be had for the asking, is also a source of valuable information—making due allowance for extravagant claims and fitness for his locality. If he has the intellect and common sense which his position demands, he will not be lead by a manufacturer's circular to order a pipe thawing transformer outfit if he is located in Florida—but he may note the value of a forge blower for his busy local blacksmith.

The periodical visits of the traveling salesman will be welcomed by the bright manager. More and more these representatives of the supply trade are men of technical ability and training, and gentlemen as well, from whom valuable information and practical suggestions may be obtained. They not only will keep him advised of the latest developments in the electical field, but often will instruct and co-operate with him in sales campaigns which will be of the greatest benefit. The man who repels the traveling salesman for fear he may sell him something is dodging one of his best instructors.

Another great source of information, which perhaps can only be enjoyed in a limited way by many, is the observation which comes through travel. The great companies have scouts always on the move to learn the best methods and means by personal observation. But even the manager of the smallest company may visit the metropolis of his district once or more each year, and no such visit should be made without coming in personal contact with the representatives of the large companies in such city. Such visits are usually welcomed by these companies, for, though he may not realize it he will give as well as receive—for the very questions she will ask, may open up new avenues of investigation and profit for the larger companies.

Finally—the manager who cannot of himself realize and avail himself of the benefits of association work is an egregious ass—and is not the subject of our consideration.

CO-OPERATION.[1]

BY ALBERT H. ELLIOTT.

If any one proposed to you a plan of organization of the electrical business, which attempted to exclude self interest, you would be justified in treating such a proposal as chimerical and unreal. In any scheme which is put forward, we should be sure to keep our feet well anchored on the practical earth of business.

There is a distinction, of course, between self interest and selfishness. Selfishness is narrow, short-sighted and ends in its own undoing. Self interest is broad, deep, has a wide horizon, and looks to the great future, instead of the limited present. Self interest has built up this wonderful world of commerce, which buzzes and whirls about us.

The laws of trade and commerce are as old almost as the laws of the Medes and Persians. For many, many years, the channels through which goods are distributed from the manufacturer to the consumer, have been cut through the geological strata of the earth, and it is useless to attempt to dam up these channels or turn them aside by Act of Congress or Decree of Court. You can no more change the great economic laws of business, than you can stand with a broom at the Golden Gate and sweep back the on-rushing tide of the restless Pacific.

It behooves us therefore, to use the laws of commerce intelligently, and to find in the distributing system by which goods get from the manufacturer to the consumer, the best way which we can work under the law to produce the best results.

The group of persons who minister to the process which I have described, are fairly well defined. The manufacturers seize the raw material, and with skill and capital, produce the electrical goods.

The jobber displays the goods upon shelf and counter, maintaining variety where he may choose, and conveys the goods to the consumer.

The electrical contractor picks the goods off shelf and counter, and installs them in the home, the store and the factory.

The central station furnishes the current, without which the electrical goods would be of no use, and stimulates the consumer to a further use of the goods.

The electrical engineer gives expert information as to the best way of placing the goods and outlines the plan of installation.

Each group here described is a link in the great chain, and each link is necessary to the maintenance of the strength of the chain.

No group can stand up and with raised hands say: "We are the electrical business." The interdependence of one group upon another is so obvious, that it is but the statement of an elementary truth to say that all of those engaged in the electrical business are interlocked, interwoven, intertwined, so that the finished product is a great economic system by which goods are produced, distributed and consumed. In fact, we have here, the genesis of electrical goods which may be compared to birth, the distribution and installation of electrical goods, which may be compared to life and the final consumption of electrical goods, when the goods are returned to earth from which all things, human and material first originated.

At this point, we come not unexpectedly upon the much used word "CO-OPERATION." Possibly some one of you may now shut your eyes and say "This is the same old theme." Yes, it is the same old song, but it is the song which is being sung now from one end of the country to the other. The doctrine of co-operation as a political theory, as a sociological doctrine, and as a commercial suggestion is is busying the mind of man.

I do not propose the old idea that man is his brother's keeper, in the charitable sense of that theme. Our plan is not a suggestion that we should do unto others as we wish to be done by, simply because we find it spoken of in the Great Book. We are prepared to demonstrate that co-operation is justified by any intelligent consideration of what we mean by self interest. It is all a matter of education.

No man is big enough to stand up and say "I will run my own business in my own way, without regard to what others in the same line of business are doing." Perhaps some of you have not yet been converted. Perhaps you have not experienced the change of heart, as they say at a religious revival.

Do you believe in team work? What we want in the manufacture and distribution of electrical goods, is perfect team work, so that all the groups who take part in the production and distribution of electrical goods, will present to the consumer a united and harmonious front.

It is not a question as to how the leaders in the business are doing, but the rank and file must work hand in hand with each other and the leaders. Our plan is ethical, because it excludes no honest man in the business and sets its face toward a policy which helps all and injures none. The plan is not fanciful, because those who have studied the matter are convinced that their ultimate self interest lies along the lines of perfect co-operation.

The consumer is included in the plan because he gets a better article at less cost and with better service. If you believe then in these principles, let us form a league where each branch of the electrical industry shall have complete representation.

The league can act as a clearing house for the settlement and adjustment of the many questions, which so vitally affect the business.

Charges of unethical business conduct may be heard and decided, and a future policy regarding the questions raised might be outlined. The league should be entirely democratic in character, and no better motto can be chosen than the one which we read of so many times, "altogether all the time for everything electrical."

If we become really enthusiastic and have faith and confidence in ourselves, our faith and confidence will become contagious and will reach the consumers. The consumers will judge our goods by the kind of people that we are.

A united electrical fraternity will lead the consumers to see that we are like our goods and our goods are like us. Co-operation is thus brought down from the clouds and made a reality.

[1]Address made at luncheon of representative electrical men at San Francisco, November 28, 1911.

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CONTENTS

The Oregon Power Company 545
By A. H. Halloran.

N. E. L. A. Convention at Seattle 549

Plant Valuations 549
By W. D. Scott.

United States Oil Investigations 551

Tests of Western Cedar Poles 552

New Business Methods for the Small Central Station 553
By Arthur Gunn.

Co-operation 555
By Albert H. Elliott.

Editorial 556
- Los Angeles Election
- Bear in a Gas Plant.
- Congressional Action on Water Powers.
- Rifle for Trouble-Shooter.
- The Electrolier Law.
- California Public Service Commission.
- Recognition of the Engineer.

Personals 558

Obituary 558

Meeting Notices 559

Electrical Men's Lunch 559

Railroad Dinner at Portland 559

Oregon Contractors Organize 559

Throop Scholarships 559

Trade Notes 559

Industrial 560
- Electrical Floral Decorations
- Electric Storage Battery Co. Convention
- Why California Isn't Alarmed.
- Restoration of Telephone Service in 98 Hours.
- Calorized Electric Soldering Iron.
- Cutler-Hammer Feed-Through Switch.

News Notes 562

The result of this week's election at Los Angeles repudiate the claim that investments in that fair city's public utilities are hazardous, and should react favorably upon the financial standing of the municipal projects as well as the telephone, electric and gas companies.

The bull in the china shop is but a circumstance to the bear in the gas plant at Banning, California. Bruin escaped from a traveling circus, invaded the plant, frightened the engineer, threw off the governor belt and caused the engine to run wild. Inasmuch as the friction from the rapidly running belt burned his fore-leg, we assume that this bear will hereafter follow the example accredited to a burned child.

Central station men are greatly heartened by Secretary Fisher's sane view of the water-power question and trust that the Sixty-third Congress will act favorably upon his recommendations for new legislation. Government officials recognize the inadequacy of the present laws and their frank acknowledgement will soon turn the tide of popular opinion which has been raised by ill-advised conservation enthusiasts. The time is most opportune for all electrical men to write to their Congressional representatives to support the bills which are intended to ameliorate the present intolerable condition.

It has remained for a lineman in the employ of the Puget Sound Electric Company to demonstrate that a rifle is a necessary part of a trouble-shooter's equipment. A toppling pole, too dangerous to climb, threatened to pull down the Electron high-tension wires. The lineman, perhaps mindful of similar depredations of the small boy with his gun, shot away the porcelain insulators on the damaged pole and thereby released the line so that the pole could be pulled down without damage.

The Electrolier Law

The good people of Alameda, California are manfully endeavoring to assume the heavy responsibilities that rest upon the shoulders of a public purveyor of electric light and power. Fearing that possible collusion among bidders might cause them to pay an unduly high price for labor and material, they recently secured the passage of the so-called "electrolier bill" through the California Legislature.

Its provisions, while intended solely for Alameda, are of course State-wide in application. Its intent was most innocent, but its effect is so vicious and opens up such a wide opportunity for petty graft that it might well be repealed before the dangers hereafter indicated assume greater proportions.

Careful reading of the 14th and 15th sections of this law will show that any California city is thereby permitted to reject a responsible bid at a satisfactory price if the head of a city department believes that the work can be done more cheaply by that department. Suppose that a responsible contractor should

submit a bid, accompanied by a certified check, which is lower than the original estimate of say the city electrician. That individual then has the privilege of making a new estimate, naturally lower than that of the contractor, and the work is awarded to his department.

It is thus seen that the contractor is not only "up against a stacked deck," but that he is playing with an irresponsible dealer whose losses will be covered by an unsuspecting house. No municipal department can be held responsible if costs exceed estimates and the public seldom analyzes the reason for an additional assessment. This law consequently gives a city lighting department a complete monopoly on all work that it may desire to perform, without restriction or accountability as to cost.

As before stated, we believe that this bill was passed in all innocence and consequently its sponsors should be the first to urge its repeal after its manifest unjustness is called to their attention.

California Public Service Commision

The most important matter now before the special session of the California Legislature is the California Railroad Commission Act, which has been drafted in accordance with the recently adopted constitutional amendments. Its terms increase the membership of the commission from three to five and gives the commission complete control over the rates, character of service, valuation, accounting methods and stock and bond issues of all public utility corporations in the State, except such powers of control as are now exercised by the various municipal and county authorities.

The bill, as originally submitted, seems ultra-radical and in strict accord with the present sentiment that public service corporations are to be rigidly accountable for all actions. Its provisions might well be extended to include a similar supervision over municipally operated utilities, where the public is interested not only in the service but also in the costs of operation. Furthermore but a small proportion of the operating companies can be subject to the commission's rulings until several of the large cities assign the rate fixing powers they now enjoy.

Yet, on the whole, it is a step in the right direction and the several inconsistencies will be gradually eliminated in the course of time. Experience has shown that the establishment of such supervisory control gives a certain financial recognition and stability on account of the equal publicity to all corporation doings. In the hands of the right men a public service commission is capable of great good in the impartial settlement of all differences between the public and the company catering to its needs.

The recent revelations of weakness in the New York act should be carefully borne in mind before final adoption of the California bill. Because of its ambiguous wording the New York State Court of Appeals has shorn the New York Commission of its authority to approve or forbid the proposed stock and bond issues of public utility companies. All obstacles to the unlimited watering of these securities are removed and until the defects are remedied by a new law the investor is left without this much needed protection.

The framers of the California bill have been especially fair in inviting free and open discussion of all its features. With a few notable exceptions, however, the central station men have been slow to take advantage of this opportunity to make desired changes before the law's final passage. If they find their future plans unnecessarily limited by its provisions they will have but themselves to blame.

Recognition of the Engineer

This week has witnessed the most significant event in the history of engineering. A movement, broad in purpose as in method, has been started whereby the engineer is to be made a vital, essential factor in the world's every-day life. Live men, not dead materials, are to be the means of rearing the new social structure now so necessary.

The American Society of Mechanical Engineers has entered the field of social service. Its committees will investigate the conditions in each of the great industries, will devise means of betterment and will put them into execution. Their call will waken the greatest, and also the sleepiest, giant this old earth has ever known. The abilities of the engineer will be brought to cope not only with these industrial questions, but also with the problems of municipal, State and national affairs. Incidentally this public service, and this alone, will bring about that recognition to which the engineer has long thought himself entitled.

Even Mohammed finally realized that his powers could not transcend the ordinary laws of nature. He went to the mountain. Likewise the engineer at last appreciates that the public does not accord recognition to those whom it does not know. The mere possession of such merit without applying it to the public welfare is as futile as the ownership of an undeveloped gold mine, notwithstanding the owner's little self-complacency.

The engineer has "wrapped his talent of silver in a napkin," whereas the other learned professions, to whose emoluments he has aspired, have given their talents to the public service, albeit full monetary return has been exacted therefor. Ministers and doctors as well as lawyers, those who save our souls and those who save our bodies as well as those for whom we save our money, are to be ousted from their monopoly in the public's confidence.

The machinery by which this beneficient revolution is to be set in motion consists of a number of committees working under the able direction of Dr. Alexander C. Humphreys, president of the Society, of Stevens Institute and of the Buffalo Gas Company. Membership in these committees is open to those best qualified without regard to Society membership.

In order that these ambitious plans be carried to a successful culmination, it will be necessary for all broad-minded, well-meaning men to join this movement. Similar concerted action is necessary on the part of the other engineering and scientific societies. Too long has the engineer hidden his light under a bushel and here is a golden opportunity to lighten the labors and problems of the world.

PERSONALS.

H. B. Squires, of Otis & Squires, is at Los Angeles.

George E. Binckley, hydraulic engineer at Los Angeles, is at San Francisco.

Arnold Pfau, hydraulic engineer with Allis-Chalmers Company, is at Los Angeles.

A. W. Burchard, of the General Electric Company, is visiting the Pacific Coast.

A. F. Hockenbeamer, secretary and comptroller of the Pacific Gas & Electric Company, is at New York.

S. N. Griffith of Fresno, a promoter of electric railroads, is at San Francisco in the interests of a new project.

Nicholas Gilman has been appointed city engineer at North Yakima, Wash.

H. H. White, general manager of the Everett Gas Company, has been transferred to the management of the Tacoma Gas Company.

S. V. Mooney, manager of the Pacific Coast branch of John A. Roebling's Sons Company, has returned to San Francisco from an interior trip.

J. B. Lukes, general manager, and E. B. Bumstead, an engineer of the Reno Power, Light & Water Company, were recent arrivals at San Francisco.

S. L. Shuffleton, northwest manager for Stone & Webster, has been in conference at San Francisco with regard to the establishment of San Francisco offices for the company.

P. H. Ridgeway, formerly associated with the Electrical Engineering Company of Seattle, has opened offices as consulting and constructing engineer in the Central Building, Seattle, Wash.

E. V. D. Johnson, manager of the Northern California Electric Company, with headquarters at Redding, has been spending a few days at San Francisco, accompanied by W. G. Moores, the assistant manager.

R. G. Berle, secretary and treasurer of the Symonds-Berle-Kirkpatrick Company, is at Los Angeles, with the intention of opening Pacific Coast offices as the representative of a number of Eastern electrical and machinery manufacturers.

J. W. Burke, the chief civil engineer of J. G. White & Co.'s staff, arrived from New York during the past week to inspect the work in progress on the new 3,000-foot tunnel on the line of the Oakland & Antioch Railway, extending through the Berkeley hills into Contra Costa County. This work is being done by Shattuck & Edinger, contractors, under the general supervision of J. G. White & Co.

C. E. Patton, representing the Central Electric Company of Chicago, visited the trade at San Francisco during the past week. He formerly confined himself to Southern California, Arizona and southwestern territory, but since James Irvine, who was at the head of the company's Los Angeles agency for the past two years, joined the Lorbeer Electric Supply Company of Los Angeles, Mr. Patton has extended his territory. His principal lines are Okonite wire and Opalux glassware.

John A. Britton, general manager of the Pacific Gas and Electric Company, gave an address last week before the Mission Promotion Association of San Francisco on the subject of the "Improved Gas Conditions in San Francisco." Fifty lantern slides were used to show what had been accomplished in the way of betterments. One slide showed the new five-million cubic foot gas-holder at the Potrero gas works placed side by side with the St. Francis Hotel. The holder, which is nearing completion, is 226 feet in height and 201 feet in diameter and cost $382,000. It is 46 feet higher and only 16 feet narrower than the Powell-street front of the hotel.

OBITUARY.

Caryl Davis Haskins, manager of the lighting department of the General Electric Company, and one of the best known electrical men of this country, died Saturday morning, November 18th, in Salt Lake City. Mr. Haskins was stricken with pneumonia while on a business trip in the west and the end came unexpectedly. The body was removed to Mr. Haskins' home at Schenectady, where a brief funeral service was held Wednesday, November 22d, temporary interment taking place at Schenectady. Mr. Haskins was born in Waltham, Mass., May 22, 1867, and was educated in England where he specialized in mathematics and physics and took a special course in surveying and fortification work. Early in 1887 he entered the employ of the firm of Haskins, Davis & Company, mechanical engineers, of London and Boston, Mass. Here he applied himself to engineering work on early gas engines and special bookbinding machinery. In 1883 he entered the employ of the S. Z. de Ferranti & Company as one of its junior assistant engineers, where he had charge of the manufacture of electrical meters and assisted Mr. de Ferranti on the drawings for the original Deptford electric light station.

Carl Davis Haskins.

In the autumn of 1889 he entered the employment of the Thomson Electric Welding Company, Lynn, Mass., as designing draftsman. Two or three months later he was employed by the Thomson-Houston Electric Company, Lynn, Mass., as an electrical engineer. In 1891 he was appointed manager of the meter department of this company and after its consolidation with the General Electric Company Mr. Haskins retained this position, including general supervision of the engineering and manufacture of instruments.

At the beginning of the Spanish-American war Mr. Haskins proffered his services to the government and organized a corps of electrical engineers and men trained in electrical work, of which he was made commander. At the conclusion of the war Mr. Haskins resumed his position with the General Electric Company. He has made a special study of electricity as applied to offense and particularly defense in time of war and was considered an authority on this subject, and after the close of the war he frequently acted in an advisory capacity to the government in matters of this nature.

Upon coming to Schenectady eleven years ago, Mr. Haskins was given charge of the electrical switchboard industry

of the General Electric Company, and in 1906 was appointed manager of the lighting department of the company.

Mr. Haskins was greatly beloved by all his associates and had an unusually wide circle of friends who will long cherish the memory of his charming versatility and brilliant intellect. He was well known as the author of many technical papers before the various engineering societies and was always in demand as a lecturer at various technical colleges and institutions. He was known in the literary world as the author of several standard works on electrical subjects, and was also the author of a number of successful short stories.

MEETING NOTICES.

On account of the Christmas holidays there will be no December meeting of the San Francisco Section of the American Institute of Electrical Engineers.

"Public Service" is to be the subject of discussion at the December 19th meeting of the Los Angeles Section of the American Institute of Electrical Engineers. Addresses will be made by T. B. Comstock, engineer for the Los Angeles Board of Public Utilities and Paul Shoup, vice-president and general manager of the Pacific Electric Railway Company.

The first of the series of regular monthly luncheons to be held by the Portland Section of the American Institute of Electrical Engineers, took place at the Imperial Hotel restaurant on December 5. The Portland Section has recently arranged to have its papers printed in these columns, and whenever papers can be prepared far enough in advance they will be printed so as to antedate the meeting, thus paving the way for a more intelligent discussion.

ELECTRICAL MEN'S LUNCH.

Pursuant to the wishes of the electrical men of San Francisco as expressed at the recent luncheon, the temporary committee, consisting of S. J. Lisberger, H. V. Carter and E. B. Strong, selected an advisory committee to draw up a constitution and bylaws and to nominate officers. This committee consists of C. C. Hillis, T. E. Bibbins, W. W. Briggs, John R. Cole, W. W. Hanscom, W. S. Hanbridge and W. F. Nieman. They will report at a lunch to be held at Tait's Cafe on December 12 at 12:15.

As this is to be the first regular meeting of the new electrical clearing house, it is the unanimous wish of the committee that every electrical man attend. It is especially important that each craft should have a large representation, and those who cannot attend the lunch are urged to participate in the subsequent meeting, which will be called to order at 1 o'clock.

RAILROAD DINNER AT PORTLAND.

A dinner is to be given at the Portland Commercial Club on December 16 to the new railroad officials of Portland and the State Railroad Commissioners. The former include Carl R. Gray, president S., P. & S., Oregon Trunk, Oregon Electric, United Railways and Spokane & Inland Empire R. R.; J. D. Farrell, president O.-W. R. & N. Co.; S. G. McMeen, president Mt. Hood Ry. & Power Co.; C. A. Coolidge, vice-president and general manager Spokane & Inland Empire R. R., general manager Oregon Electric and United Railways; W. N. Porter, treasurer Mt. Hood Ry. & Power Co.; F. W. Hild, general manager P. R., L. & P. Co.; D. W. Campbell, general superintendent Southern Pacific Company; J. M. Scott, general passenger agent, Southern Pacific Company; H. E. Lounsbury, general freight agent Southern Pacific Company; G. H. Smitton, assistant general freight and passenger agent Great Northern Railway; W. P. Warner, district freight and passenger agent, C., M. & P. S. R. R.; J. H. Mulchay, assistant general freight agent Southern Pacific Company; A. B. Hutchinson, purchasing agent Southern Pacific Company, and G. W. Saul, purchasing agent O.-W. R. & N. Co.

The following are members of the various committees: General arrangements, Guy W. Talbot, A. M. Shannon, A. O. Jones, D. O. Lively and E. H. Ransom; invitation, Hugh Hume, Guy W. Talbot and F. C. Malpas; attendance, J. W. Minto, J. E. Webb, J. P. Porter, M. L. Kline, J. S. Ball, G. J. Major, F. S. Doernbecher, J. Louisson, and Phil Metschan, Jr.; speakers, F. C. Malpas, C. K. Williams, H. S. Tuthill, D. T. Honeyman, H. L. Corbett and R. L. Macleay; entertainment, J. Fred Larson, W. A. Montgomery, L. A. Colton, Hugh Hume and V. Vincent Jones.

THROOP SCHOLARSHIPS.

A friend of Throop Polytechnic Institute, of Pasadena, California, who believes in the educative value of travel, has established two scholarship awards, to be known as the Senior and Freshman Scholarship Prizes, respectively. The Senior Scholarship Prize, consisting of $750, to be expended in a trip to Europe, is awarded to that member of the graduating class who has the best record in scholarship for the junior and senior years, the faculty taking also into account, in assigning the award, considerations of deportment, or good manners, and ability for original work. The Freshman Scholarship Prize, consisting of $250, to be used in a journey through some of the principal cities of the Eastern United States, is awarded on each commencement day to that member of the freshman class who has the best scholarship record for the year, good manners and the quality of initiative being also taken into account.

OREGON CONTRACTORS ORGANIZE.

Oregon members of the National Electrical Contractors' Association are arranging for the establishment of a state association. Fred W. Webber, state electrical inspector, acting as chairman, has appointed committees to draw up a constitution and bylaws.

ELECTRICITY ON THE SUNSET LIMITED.

The electrical equipment of the Sunset Limited, which the Southern Pacific Company is again running semi-weekly between San Francisco, Los Angeles and New Orleans, is one of the most important features of the new train de luxe. Electric lights, fans, telephones, appliances for barbers and hair-dressers, as well as electrically operated block signals contribute greatly to the comfort and safety of travel on this train, which brings New Orleans one day nearer to the Coast. Thousands of dollars have been expended by the railroad company in an effort to make the "Sunset Limited" a peerless conveyance for the discriminating transcontinental traveler. The all-steel Pullman cars which compose the train have been especially constructed for this new service, and all elaborations have been made with the idea of insuring the comfort of "Sunset Limited" patrons.

TRADE NOTES.

The first Francis turbine unit of the Pacific Coast Power Company's White River plant near Tacoma, Wash., is now in commission. The Allis-Chalmers Company report that this 15,000 kw. machine is being excellently governed by their new design of pressure regulator, and is taking care of the pressure fluctuations of the entire system.

L. F. Yondall, manager of the Electric and Machine Equipment Company of Stockton, is rebuilding two pumping plants for Irrigation District No. 684. He will install a 150-h.p. Westinghouse motor and transformers. He is also replacing a gas engine with a 200-h.p. Westinghouse motor for the Delta Land Company. The Pacific Gas and Electric Company is running a branch power line into this district to furnish current for pumping.

INDUSTRIAL

ELECTRICAL FLORAL DECORATIONS.

Light is more nearly symbolical of the spirit of Christmas than any other physical manifestation. The electric light, in particular, is annually becoming a more important factor in the observance of this festival, not only on the Christmas tree, but on the table. For this purpose many beautiful designs are now available, a few being shown on this page.

Large Rose Basket.

Hanging Baskets of Roses.

Electric Lighted Rose Vase.

These comprise a number which the Brooks-Follis Electric Company of San Francisco is prepared to furnish the dealer and central station in time for the annual holiday trade. They are the products of the highest artistic skill and are also electrically perfect, being fully approved for connection on the ordinary lighting circuits. They comprise vases and baskets of roses, chrysanthemums, tulips and poinsettas in all the colorings of nature, as well as the various table fruits. As such they make a most effective and beautiful decoration for the home electrical.

ELECTRIC STORAGE BATTERY CO. CONVENTION.

The Electric Storage Battery Co. of Philadelphia, held the sixth convention of its staff and sales department at the Bellevue-Stratford, Philadelphia, on November 6th, 7th, 8th, 9th and 10th. The convention was attended by the managers and salesmen from its various sales offices in Philadelphia, New York, Chicago, Boston, Cleveland, St. Louis, Denver, Detroit, Atlanta, and San Francisco. At the conclusion of the convention a company banquet was held at the Radnor Hunt Club.

WHY CALIFORNIA ISN'T ALARMED.

The Financial World of New York recently commented on California conditions as follows:

A leading bond and investment house which is interested largely in public utility enterprises in California, has received from its San Francisco correspondent a review of conditions in the State which perhaps goes far toward explaining why capital and bankers generally have been viewing with the greatest complaisance the recent victory of the radicals in the California elections. Woman suffrage, the recall, the initiative and referendum, a rate-regulating commission and many radical measures designed to restrict capital, were indorsed at that election, and most of these policies will be incorporated in the new State Constitution next year. Since the election there have been primary contests under the new laws and radicals have been named for office in several large cities. But capital has never been the least disturbed and at the present time there are, perhaps, in prospect in the chief State of the Golden West, more new enterprises than ever before undertaken.

The letter above referred to, written well after the elections and at a time when the full effect of the contests could be judged properly, says that as far as the banks in California cities are concerned the average city bank in California is at present carrying a larger account in bonds than any of the country banks in any other section of the country. One possible exception, the correspondent says, may be some of the old investment institutions in the Eastern States, in which the demand for money is very small. With the California banks well supplied with bonds, nevertheless the demand for investment securities is still very good, and this is probably due to the very heavy crops, such as barley, hops, fruits, etc., and for which the prices are the highest in a long period. The proof of the general prosperity is to be found in the fact that the bank deposits have practically doubled in the last three months. There is also general satisfaction at the continued good earnings of the great public utility companies throughout the State.

All this evidence of prosperity is, we think, proof that the alarm felt in many quarters over the advent of radical policies and extremists in politics is greatly overdone, and especially are the harmful effects less apparent when crops are good and prosperity reigns. The radicalism of today is little more than the expression of undue caution over the rapid increase in wealth the country over. Perhaps if we did not have this check as a sort of balance wheel recklessness and expansion in finance and trade might go to alarming lengths.

RESTORATION OF TELEPHONE SERVICE IN 98 HOURS.

The Missouri and Kansas Telephone Company's Fairmount Exchange, at Kansas City, Missouri, was completely destroyed, on Sunday, October 22d at 3 a. m., by a fire which is believed to have been caused by an explosion of gas in the house adjoining that in which the central office was located. The telephone company at once communicated with the Western Electric Company and the work of restoring service to the subscribers was begun at 9 o'clock of the same morning, when a dozen men from the electric company's local installing force appeared upon the scene.

The Hawthorne factory of the Western Electric Company was called upon by long distance telephone to make a hurry-up shipment, and responded by sending forward the necessary apparatus by express the evening of the day on which the fire occurred, thus supplementing without delay the work which was being done by the local house in rushing material to the building in which the new exchange was to be housed.

The new switchboard equipment consisted of several sections from the telephone company's stock, and some from an addition which was to be installed at the Rosedale Exchange, on account of the increasing business in that district. Twenty-six installers reported for work on Monday morning, October 23, and from that time until the new board was cut in service at 5:00 a. m., October 26th, with a full equipment of 800 subscribers' lines, a day and night crew were at work continuously.

Taking into consideration the fact that the work was done under high speed conditions, in order that the subscribers might not be inconvenienced for an extended period, it is worthy of note that the trouble reports issued as a matter of routine by the telephone company indicate that the work of the Western Electric Company's installing force was so well done that a minimum of trouble was experienced after the new equipment was cut into service.

CALORIZED ELECTRIC SOLDERING IRON.

The use of the ordinary soldering iron has two serious drawbacks—the impossibility of keeping it hot continuously, and the rapid wasting away of the copper. The development of the electric soldering iron obviated the former, furnishing the mechanic with an iron which not only stayed uniformly hot all the time, but one in which the heat intensity could be easily regulated by the mere turning on or off of the current. The second fault, that is, the rapid wasting away of the copper, still remained, to a large extent, necessitating frequent renewals, and, consequently, making no reduction in the cost of maintenance.

Therefore, it is of much interest to metal workers to know that many experiments made in the research laboratories of the General Electric Company to mitigate this fault has resulted in the discovery of a process of treating the copper which renders the latter non-oxidizable under high heats and non-corrodable by the acids used in soldering. Furthermore, it reduces to a minimum the dissolving action of the molten tin, with which the working tip must always be kept coated.

This "calorizing" process or method of treatment does not merely coat the surface of the copper with a thin layer of non-oxidizable or non-corrodable substance, liable to scale off under the effects of heat and acids; but actually changes the characteristics of the copper to an appreciable depth. Thus the durability or practical working life of the copper is increased to such an extent as to provide a soldering iron of maximum economy and effectiveness.

CUTLER-HAMMER FEED-THROUGH SWITCH.

The Cutler-Hammer Feed-Through Switch provides a convenient means for controlling heating device circuits. Flat irons, toasters, disc stoves, chafing dishes, percolators, soldering and branding irons, etc. can be more economically operated if a convenient means be provided for turning on and off the current.

This switch is also of value in manufacturing plants. Portable drills, vacuum cleaner sets, electric hammers and other electric motor-driven and heating devices can be controlled by this feed-through switch. The devices mentioned are often operated at considerable distances from their sources of current supply and a ready means for opening and closing the circuit saves valuable time.

The feed-through switch provides a convenient means for breaking the circuit when the iron gets too hot or when the work being done is of such a nature as to require a cooler iron. To manipulate the key of the fixture socket frequently is inconvenient and also results in rapid destruction of the socket.

NEWS NOTES

INCORPORATIONS.

ASHLAND, ORE.—The Dead Indian Telephone Company, capital $2000, of this place, has been incorporated.

LOS ANGELES, CAL.—Empire Electric Company—capital $100,000; directors, E. J. Rose, S. J. Mathes, A. H. Honey, P. H. Tyler and F. J. Ryan.

LOS ANGELES, CAL.—Union Coal & Electric Company—Capital $1,000,000; directors, R. O. Young, G. C. Beaman, W. H. Packard, G. R. Williamson and I. C. Long.

LOS ANGELES, CAL.—Miller Storage Battery Company, incorporators George J. Miller, Frank J. Miller, Clarence H. Miller, Albert Burdett Hanson and Thomas L. Gifford, capital stock $10,000.

LOS ANGELES, CAL.—California Pipe Line Company—capital, $5,000,000; directors, R. L. Cox, J. Fred Gale, S. N. Clark, J. J. Doran, August P. F. Hartnack, Homer R. Crouse and J. H. Englehart.

LOS ANGELES, CAL.—Eureka Electric Manufacturing Company, incorporators, F. W. Post, F. B. Howard, James A. McGowan, Fred St. Clair and A. A. Cole; capital stock, $100,000; subscribed, $1.

SANTA ROSA, CAL.—California Telephone & Light Company, $10,000,000, by J. E. Bennett of Palo Alto, F. L. Wright of Santa Rosa, A. H. Spurr of Lakeport, M. S. Sayre of Lakeport, W. P. Ferguson and S. Pickering of Santa Rosa and H. L. Nay, Kellogg.

STAYTON, ORE.—The Santiam Light & Power Company has been incorporated for $25,000 by A. L. Shreve, S. L. Stewart and J. W. Mayo to take over the property and business of the Stayton Electric Light Company. A number of improvements and additions are to be made to the system.

SAN BERNARDINO, CAL.—The Citrus Belt Gas Company has been organized with capital stock of $1,500,000, to take over the plant of the San Bernardino Valley Gas Company. The directors are: A. M. Ham, E. D. Roberts and Z. T. Bell of this city, F. Morrison of Redlands and E. S. Moulton of Riverside. The company will not only supply gas, but electrical energy both for light and power purposes.

SACRAMENTO, CAL.—Articles of incorporation have been filed of the Sacramento & Eastern Railway. The road is to extend from Sacramento to Folsom and is incorporated for $1,000,000. The incorporators are Charles H. Hammon of Berkeley, L. J. de Sabla, San Francisco; Samuel Lillienthal, San Francisco; George E. Springer of Oakland and Herbert W. Furlong of Pleasanton. Twenty thousand dollars' worth of stock has been subscribed, Hammon having pledged for $18,000 of this and the other $500 each. The road will be approximately 60 miles in length, swinging southeast from Sacramento to a point midway between the capital city and Folsom and then northeast into Folsom, practically keeping in view of the Southern Pacific the entire distance.

PORTLAND, ORE.—The Deschutes Rimrock Power Company has been incorporated with a capital of $1,000,000, with Malcolm A. Moody as president and LeRoy Park, as secretary and treasurer. The company expects to start actual construction work within 90 days, as the entire bond issue of $9,000,000 has been approved and money will be available for work within that time. The project provides for a small dam 500 feet long and 20 feet high, which will be capable of developing a minimum of 15,000 horsepower and the other and more important dam will be a hollow concrete structure of the Ambursen type, 140 feet high and over 600 feet in length. This will develop a minimum of 60,000 horsepower and will be the greatest power dam in the Greater Northwest. The two dams will be 7000 feet apart, the smaller being placed just north of Moody, the first station south of the Columbia River on the Deschutes railroad. The land to be watered lies on the Columbia River and will include in its first unit 15,000 acres.

ILLUMINATION.

PASCO, WASH.—The City Council has ordered the street lighting committee to engage Engineer H. Day Hanford of Seattle to prepare plans for a municipal lighting plant.

HOOD RIVER, ORE.—On recommendation of the light and water commission the City Council has contracted with the hydroelectric company for the term of 10 years for lighting the city streets,

SAN DIEGO, CAL.—The City Council has decided to approve plans of Superintendent Adams to light the down town streets with ornamental cluster lights. All lights in down town district will be in by January 1.

BAKERSFIELD, CAL.—The City Clerk has been instructed to advertise for bids for lighting the streets of Bakersfield with luminous arcs, the number of lights to range from 175 to 250, and the lighting to be on the all-night basis.

WATSONVILLE, CAL.—This city is to have an improved system of street lights. The system recommended by S. W. Coleman, manager of the Coast Counties Light & Power Company, consists of 350 Mazda type arc lamps.

FALLON, NEV.—At the last meeting of the City Council the plans and estimates presented by City Engineer C. P. Osgood for an electric light system for the city were accepted and the city attorney was instructed to draft an ordinance providing for the issuance of bonds to the extent of $15,000 to install the proposed system.

SAN FRANCISCO, CAL.—The State Board of Control is preparing to contract for the purchase of all the electric light globes used in all of the State institutions by bulk. It is estimated that 25,000 electric bulbs are used in the State institutions each year, and by purchasing them in bulk a saving of approximately $5000 will be made.

BERKELEY, CAL.—Mayor J. Stitt Wilson has been asked by the City Council to procure data on the cost, charges and other information on municipal lighting plants which are now in operation throughout the country. The action of the council came after a proposal of the mayor, in a special message, that the city establish such a plant.

ALBANY, ORE.—W. H. McGoldrick has accepted the gas plant franchise granted him recently by the city. A forfeit of $1000 has been posted to guarantee the erection of the plant within a year. It is also asserted that McGoldrick is organizing a company to be known as the Albany Gas Company, to be incorporated with a capital of $500,000. A franchise was also received to install gas pipes along public highways in Linn county.

TULARE, CAL.—At a metting of the officers of the Tulare County Power Company a contract was awarded to Oscar Parlier for the brick and cement work on the auxiliary power plant to be erected in this city. There were several bidders,

but Mr. Parlier's bid was the lowest and most satisfactory. He will be required to lay about 200,000 bricks and build 7000 cubic feet of cement work. The contracts for the carpenter work will be let at an early date.

TRANSPORTATION.

PORTLAND, ORE.—The Southern Pacific Railway has entered into a contract with the Portland Railway, Light & Power Company for delivery of 5000 h.p. for the company's local Fourth street line. The railway will be electrified.

BAKERSFIELD, CAL.—The Board of Trustees passed an ordinance granting a franchise to the San Joaquin Light & Power Corporation, the right to construct and operate a street and interurban street railroad along, over and across certain streets, highways, etc., in the city of Bakersfield, Cal.

NAMPA, IDAHO.—Wm. Mainland and others have received a franchise of 50 years' duration for the construction of an electric street car system in this city. The franchise contains the usual paving clauses and other safeguards and provides that the franchise is void in case cars are not in operation by July, 1912.

CLE ELUM, WASH.—The Brown Company, Bailey building, Seattle, has been commissioned consulting engineers by the Kittitas Railway & Power Company to make preliminary and permanent surveys for its new hydroelectric development and electric railway from this city into the Cle Elum mining district, a distance of about 40 miles, at a cost of about $1,500,000.

VALLEJO, CAL.—The directors of the Vallejo & Northern Railroad voted to float $10,000,000 more in bonds. This money is to be used in construction and equipment. In order to simplify trade matters, T. T. C. Gregory has had the railway holdings turned over in his name. President Gregory appeared before the City Council and presented the map of the roadway through this city, and announced that as soon as it was accepted he would advertise for bids on grading. An ordinance extending the necessary permission for the road to use the city streets was ordered drawn up.

TRANSMISSION.

GOODING, IDAHO.—The substation of the Shoshone & Twin Falls Light & Power Company was burned a few days ago.

LEWISTON, IDAHO.—The proposition of installing a dam in the Clearwater River to provide a power plant for municipal and manufacturing purposes is receiving the consideration of the City Council.

STANFORD UNIVERSITY, CAL.—The construction of a new $14,000 powerhouse will be commenced at once between the history building and the football field. The plans were prepared by Prof. W. F. Durand. The building will furnish more shop room and experimental laboratories for the engineering department.

LEAVENWORTH, WASH.—A crew of engineers assembled at this point recently, taking final measurements and soundings on the river, preparatory to the construction of a concrete dam to be installed this winter for the Washington Steel & Iron Company. The company also proposes the establishment of a power plant to generate from 4000 to 6000 h.p. It is understood that plans are in course of preparation and at their completion bids on a general contract will be called for.

FRESNO, CAL.—Engineers of the contracting firm of Stone & Webster has arrived from Los Angeles in company with G. O. Newman, head engineer of the Pacific Light & Power corporation, and has gone with Mr. Newman and Manager A. G. Wishon of the San Joaquin Light & Power Company, to Big Creek, where a big power plant and dam are to be constructed. Preliminary work in this construction has been superintended by Mr. Newman, under the supervision of Mr. Wishon, and now the entire job of construction is to be turned over to Stone & Webster, under a newly formed contract.

RENO, NEV.—The Nevada Valleys Power Co. has been incorporated under the laws of Nevada, with Reno as the principal place of business and an authorized capital of $2,500,000. Messrs. J. E. Bowes, Hurley and M. S. Hamilton of Oakland are among the incorporators. Leon M. Hall, electrical engineer, is interested in the project and W. H. Leffingwell is the company's engineer. It is proposed to install two power plants in Storey County, Nevada, about 14 miles east of Reno with effective heads of about 90 and 75 feet, respectively. It is estimated that a total of 5500 h.p. can be generated and transmitted to Virginia City, Reno and elsewhere.

TELEPHONE AND TELEGRAPH.

MIDVALE, IDAHO.—The Midvale Telephone line has been sold to Levi Keithly and Roy Delashmutt. An entire new equipment is to be located in the McCrum building on Bridge street.

KLAMATH FALLS, ORE.—After keeping forty fires going night and day for weeks to heat concrete, and building large canvas walls and ceilings over the work to keep the heat in, the contractors of the Lost River diversion dam, building for the reclamation of 50,000 acres inundated by Tule Lake, have put in all the concrete without damage from frost. The dam is of the horseshoe type.

SUSANVILLE, CAL.—Application for a franchise for a period fo 50 years has been made by the Honey Lake Valley Mutual Telephone Association to the Board of Supervisors, for the right to erect, construct and operate a telephone and telegraph line over certain roads and highways in the county of Lassen. Bids will be received for the sale of said franchise up to January 4, 1912, at which time the franchise will be sold to the highest bidder.

WATERWORKS.

MEDFORD, ORE.—The citizens of Gold Hill have adopted a new charter and passed a bond issue of $25,000 which will be used to construct a modern water supply.

McMINNVILLE, ORE.—A. L. Richardson of the Portland engineering firm of Stannard & Richardson is preparing the plans for the installation of a water system at Carlton.

SEATTLE, WASH.—Prof. E. O. Eastwood, consulting engineer of the university, has completed plans for a 100,000 gallon steel water tank recently. Bids are to be called for immediately.

LOS ANGELES, CAL.—The Verdugo Springs Water Company has been awarded a contract for laying 5000 feet of four-inch steel water mains throughout the Kenilworth Tract, in Glendale. The Southern California Gas Company will supply gas for the tract.

RICHMOND, CAL.—The contracting agent of the Union Water Company of Oakland, Col. M. M. Ogden, has announced that his company, owned by the United Properties corporation will invade the Richmond territory at once in opposition to the Peoples company. The latter has up to this time held a monopoly of the field, with the exception of the private water company that serves the Santa Fe district.

ALPHABETICAL INDEX TO ADVERTISERS

Aluminum Company of America..... 4
American Bridge Company .....
Benjamin Electric Manufacturing Company.....
Blake Signal & Manufacturing Company..... 3
Bonestell & Company.....14
Bridgeport Brass Company..... 4
Brill Company, The J. G.....
Brilliant Electric Company.....
Brooks-Follis Electric Corporation..... 15
Buckeye Electric Company, The.....
Century Electric Company..... 8
Colonial Electric Company.....
Colonial Electrical Agency Company.....
Crocker-Wheeler Company .....
D. & W. Fuse Company.....
Dearborn Drug & Chemical Works.....14
Duncan Electric Manufacturing Company 5
Economy Electric Company.....
Electric Storage Battery Company.....
Electrical Engineers' Equipment Company..... 2
Farnsworth Electrical Works .....
Farrar & Company, J. C.....
Fort Wayne Electric Works.....
Fostoria Incandescent Lamp Co.....15
General Electric Company..... 16-17
Gould Storage Battery Company.....
Habirshaw Wire Company.....
Hammel Oil Burner Company.....
Hemingray Glass Company..... 3
Hitchcock Military Academy..... 5
Holophane Company .....
Home Telephone Company.....
Hughes & Company, E. C.....14
Hunt, Mirk & Company.....
Indiana Rubber & Insulated Wire Co.....18
Johns-Manville Co., H. W..... 5
Kellogg Switchboard & Supply Co.....
Kelman Electric & Manufacturing Co.....
Klein & Sons, Mathias..... 5
Leahy Manufacturing Co. .....
Locke Insulator Manufacturing Co..... 4
McGlauflin Manufacturing Co. .....
Moore & Co., Engineers, Chas. C.....
Multiple Arch Hydraulic Construction Company, Ltd..... 2
National Metal Molding Company.....18
New York Insulated Wire Company.....
Ohio Brass Company.....
Okonite Company 18
Pacific Gas & Electric Company.....14
Pelton Water Wheel Company.....14
Pierson, Roeding & Company..... 4
Pittsburg Piping & Equipment Company.....18
Portland Wood Pipe Company..... 5
Schaw-Batcher Company Pipe Works, The .....
Southern Pacific Company.....18
Sprague Electric Works 5
Standard Electrical Manufacturing Company.....
Standard Underground Cable Company.....18
Technical Book Shop..... 5
Tracy Engineering Company.....
Thomas & Company, R.....
Western Electric Company..... 2
Westinghouse Machine Company.....
Westinghouse Electric & Manufacturing Co..... 6
Weston Electrical Instrument Company..... 3
Wilbur, G. A..... 5

Century

SINGLE PHASE SELF STARTING

MOTORS

DO NOT INFRINGE

In the suit instituted against us by a competitor about 7 years ago for alleged infringement of the "Gutmann" patents, to which prominence has been given in an endeavor to influence trade,

The United States Circuit Court of Appeals for the Eighth Circuit, on Nov. 21st handed down a decision remanding the case to the lower court with instructions to dismiss the suit.

CENTURY ELECTRIC COMPANY

19TH AND OLIVE STS., ST. LOUIS, MO.

Western Sales Offices and Stocks at San Francisco, Los Angeles, Portland, Spokane, Salt Lake City.